

CHARGE NUMBER: Project 1720
PROJECT TITLE: Physiochemical Morphology Research
PERIOD COVERED: August 1-31, 1984
PROJECT LEADER: C.E. Thomas
DATE OF REPORT: August 30, 1984

I. Low Temperature Microanalysis

Tobacco samples were collected from the Southern Piedmont Station at Blackstone, Virginia. Ripe and senescent midstalk leaves of burley (Va. 504), sun cured, and bright (Coker 319) were de-stemmed and dried for elemental analysis. Fresh specimens of these samples were also frozen in liquid nitrogen for subsequent EDS analysis as frozen hydrated specimens. EDS spectra were collected from frozen dried specimens of comparable greenhouse tobaccos. Spectra were also collected from a K^+ /p standard with a synthetic biological matrix. Relative intensities from this standard will be used to correct for the masking effects of the chromium sample coating.

II. Digital Image Analysis

A program has been written to calculate the size of a tobacco leaf from an image of the leaf produced by a video camera. The system can calculate leaf area, length, width, and number of holes. Another program has been written to measure the length and number of tobacco particles in cut filler. Specifically, the tobacco filler from a single Marlboro 85mm was studied. The total tobacco object count was 1208 pieces with a mean fiber length of 4.48mm. There were 1050 objects shorter than the mean length and they consisted mostly of fines with a diameter of 1mm or less. The longest tobacco shred was 48mm.

III. Reports, Publications:

1. Baliga, V.L.; Counts, M.E., "Identification of Calcium Oxalate Crystals in Dried or Fixed Tobacco Leaf," Proceeding of 42nd Ann. Electron Microscopy Society of America, (G.W. Bailey, Ed.) p. 288, 1984 (Presented Internally August 2, 1984).
2. Echlin, P.; McKoon, M.; Taylor, S.E.; Thomas, C.E.; Maloney, K.; Hayes, T.L.; "Bulk Standards for Low Temperature Biological X-ray Microanalysis" "Proceeding of 42nd Ann Electron Microscopy Society of America" (G.W. Bailey, Ed.) p. 282, 1984.
3. Owens, A.; "July Daily Light Intensity Averages - Greenhouse," Memo to E. Thomas, August 15, 1984.

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4. Taylor, S.E.; Echlin, P.; McKoon, M.; Hayes, T.L.; "Low Temperature X-ray Microanalysis of Frozen-Hydrated Tobacco Leaves" Proceeding of 42nd Ann Electron Microscopy Society of America (G.W. Bailey, Ed.) p. 284, 1984. (Presented internally August 9, 1984)
5. Thomas, C.E.; "Puff by Puff Mainstream and Sidestream Tar Deliveries of Passport 84mm and Passport 72mm Cigarettes" Memo to B. Kuhn, July 23, 1984 (Also presented at monthly development meeting August 8, 1984).

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